

Oberon.

		N. elong.			Inf. conj.			S. elong.			Sup. conj.
		h			h			h			h
Jan.	8	15.6	Jan.	12	0.4	Jan.	15	9.1	Jan.	18	17.9
	22	2.7		25	11.5		28	20.3	Feb.	1	5.1
Feb.	4	13.9	Feb.	7	22.7	Feb.	11	7.5		14	16.3
	18	1.1		21	9.9		24	18.7		28	3.4
March	3	12.2	March	6	21.0	March	10	5.8	March	13	14.6
	16	23.4		20	8.2		23	17.0		27	1.8
	30	10.6	April	2	19.4	April	6	4.2	April	9	13.0
April	12	21.8		16	6.6		19	15.4		23	0.2
	26	9.0		29	17.8	May	3	2.6	May	6	11.4
May	9	20.2	May	13	4.9		16	13.7		19	22.5
	23	7.4		26	16.2		30	0.9			

Observations of Meteors, Nov. 25-28, 1880.
By W. F. Denning, Esq.

Observations for the Andromedes or meteors of Biela's Comet were commenced here on Nov. 25, and partly continued until Nov. 29, but there were no active indications of the showers' return.

On Nov. 25 the sky was watched at intervals, but meteors were somewhat scarce. Only one was noted between 5^h 45^m and 6^h 15^m, and that belonged to a radiant near η *Ursæ Majoris*. At 6^h 42^m a fine slowish meteor, with a thick spark-train, was seen shooting between α *Cephei* and δ *Cygni*, and its path conformed exactly to the radiant of the Andromedes. Several other meteors were recorded, but they were obviously directed from showers in *Taurus*, *Auriga*, and *Draco*.

On Nov. 26 a very remarkable meteor was seen at 6^h 14¹/₂^m. When first observed it was passing 5° N.E. of ι *Ceti*, with a singularly slow motion, and its disappearance occurred 2° below ζ - η *Aquarii*. Length of path 31°. Directly I saw the meteor I began to count, and had enumerated 52 at its extinction. This I found by comparison with a seconds watch immediately afterwards to be equivalent to 15 seconds. The entire duration of the meteor must have considerably exceeded this, for it had already traversed a section of its course when it first came under my observation. It was the slowest meteor ever seen here. The radiant point was probably in *Eridanus* on the E.S.E. horizon. Only one meteor was observed during the evening with a path conforming with the radiant of the Andromedes, but observations were not of long duration.

On Nov. 27 the sky was observed during about three hours before 13^h 20^m, and 24 meteors registered, but no Andromedes.

Though on the two preceding nights this shower may have been very feebly visible, there was not, on the 27th, the slightest evidence of its return. A few fine meteors were seen belonging to two well-known streams of Taurids (at $63^{\circ} + 21^{\circ}$ and $78^{\circ} + 24^{\circ}$): indeed, one-half the total number observed belonged to these showers, the former of which appeared to be the richer of the pair. I had never seen the Taurids I. so late before, though in 1876, Nov. 20, the shower was well observed here as a prominent display of bright meteors from the point $62^{\circ} + 22\frac{1}{2}^{\circ}$; and in the *Monthly Notices*, vol. xxxix. p. 23, I had pointed out the probable endurance of the shower until Dec. 6. As to the companion shower near β -*Tauri* noticed this year, that also was well observed in 1876, both at the end of November and early in December, when 26 of its meteors were recorded. It was reobserved in 1877 by Messrs. Corder and Sawyer and the writer, and in 1878 Mr. Sawyer, during a series of observations for the Andromedes, found this the chief shower visible, and determined its radiant at $81^{\circ} + 21^{\circ}$ (9 meteors). Mr. Greg designated this stream the Taurids II., in order to distinguish it from its rival and apparently contemporary shower near ϵ *Tauri* (the Taurids I.). It evidently forms a display above the average strength, and endures from Nov. 22 to Dec. 12 without apparent cessation. The following are the observations of this stream which have been made since 1876:—

		α	δ		
1876	Nov. 22-Dec. 8	80°	$+23^{\circ}$	26 ↓ s	Denning,
1877	Nov. 25-Dec. 13	81	+25	6 ↓ s	Denning,
1876-9	December	78	+23	20 ↓ s	Corder,
1877	Nov. 30-Dec. 9	80	+22	10 ↓ s	Sawyer,
1878	Nov. 26-29	81	+21	9 ↓ s	Sawyer,
1879	November 27	78	+24	5 ↓ s	Denning.
	Dec. 7-13	83	+23	27 ↓ s	Denning (Foreign Obs.)
[1869	December 11	82.9	+22.9	stationary ↓	Bartel (Brünn)],

giving an average position at $80^{\circ}5 + 23^{\circ}0$ from the eight observations.

The largest meteor seen this year on Nov. 27 was a Taurid at $9^{\text{h}} 2^{\text{m}}$ brighter than *Jupiter*. It traversed nearly the whole of its path as an ordinary shooting-star less than first magnitude, but suddenly burst out, at the end-point, into a brilliant flash, where it left a short streak of about $\frac{1}{2}^{\circ}$ for some 5 seconds. At $12^{\text{h}} 29^{\text{m}}$ a stationary meteor was noted in $78^{\circ} + 24^{\circ}$. It was evidently approaching the observer in a sinuous course, so \odot , and appeared in the diverging point of the Taurids II.

On Nov. 28 observations were renewed, but there were no Andromedes, though the showers of Taurids continued in active progress. The following were the most remarkable shooting-stars registered on the several nights of observation:—

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Paths of Shooting Stars. November 25-28, 1880.

No.	Date. 1880	G. M. T. h m	Mag.	Path from α to δ	Length of Path.	Notes.	Radiant Point.
1	Nov. 25	6 42	1	$319^{\circ}+58^{\circ}$	$289^{\circ}+51\frac{1}{2}^{\circ}$	$1\frac{1}{2}$ sec. Bright train.	γ Androm.
2	26	6 14 $\frac{1}{2}$	2	6-7 $\frac{1}{2}$	335-4	15 sec.; yellow; very slow. Died out in a faint spark.	Eridanus
3	26	6 52	2	27+54	26+60	Slow.	? γ Androm.
4	27	7 36	1	21-9	9-17	3 sec.; very slow; sparks.	Taurid I. or II.
5	27	9 2	> 4	57+67	38+82	Bright flash and streak at the end.	Taurid I.
6	27	11 13	1	27+16	14+12	Slowish.	Taurid I.
7	27	12 16	2	15+24	350+20	Slow.	Taurid I.
8	27	12 29	2	18+5	7-2	Bright train; on horizon.	Taurid I. or II.
9	27	12 29	3	78+24		Stationary; $1\frac{1}{2}$ sec.	Taurid II.
10	27	12 38	2	54-9	52-16	Short and swift	Taurid I.
11	27	12 45	1	86+56	95+70	Not swift; train.	Taurid II.
12	27	13 0	> 1	211+41	229+41 $\frac{1}{2}$	Slowish; on horizon.	?
13	27	13 15	3	49+25	45+10 $\frac{1}{2}$	Very very swift.	η Ursæ.
14	27	13 20	4	54+16	49+14	Slowish. Foreshortened near radiant.	Taurid I. or II.
15	28	7 33	1	336+55	290+39	Slowish.	Taurid I.
16	28	12 6	2	343+36	333+32	Rather swift.	Taurid II.

At 10^h 59^m, Nov. 27, two small meteors appeared simultaneously, in the Lynx, with paths intersecting thus :—